is an amine or compound II being an amine if compound I is a carboxylic acid; wherein

a) the molar ratio of compound II to compound 1 is less than 1 where compound I is bifunctional;

b) the molar ratio of compound II to compound I is less than 2 when compound I is trifunctional;

c) the amounts of units derived from all carboxylic acids and amines in the polyamide satisfy formula

$$P < 1 / [(F_A - 1)\ (F_B - 1)] \qquad (1)$$

where

$$P = [\Sigma\ (n_i\ f_i)]_x / [\Sigma\ (n_i\ f_i)]_Y \qquad (2)$$

where $P \leq 1$ and either X = A and Y = B, or X = B and Y = A, and

$$F_x = \Sigma\ (n_i\ f_i^2) / \Sigma(n_i\ f_i) \qquad (3)$$

for, respectively, all carboxylic acids (X = A) and all amines (X = B), where f_i is the functionality of either the carboxylic acid ($f_i = v_i$) or amine ($f_i = w_i$), n_i being the number of moles of the carboxylic acid or amine and the summation involving all units derived from carboxylic acids and amines in the polyamide.

2. (Cancelled)

3. (Amended) The polyamide according to claim 1, wherein the functionality of compound I is 2.

4. (Reiterated) The polyamide according to claim 3, wherein at least a unit derived from monofunctional carboxylic acid or amine is present.

5. (Amended) The polyamide according to claim 3, wherein compound I is terephthalic acid or 1, 6-hexa-methylene diamine.

AB

6. (Amended) The polyamide according to claim 3, wherein compound II is 1, 3, 5-tris (caproic acid) – melamine, trimesic acid or bis (hexamethylene triamine).

7. (Reiterated) The polyamide according to claim 1 wherein the AB monomer is an α, ω – amino acid and/or a lactam.

8. (Amended) The polyamide according to claim 7, wherein the lactam is δ-caprolactam.

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9. (Amended) A process for the preparation of a polyamide film comprising forming a film from a polyamide according to claim 1.

10. (Amended) A fiber, film, foam or molded article formed from polyamide according to claim 1.

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11. (Amended) A film formed from a polyamide according to claim 1.

Please add the following new claims:

12. (New) A process for preparing intrinsically gel-free, randomly branched polyamides comprising:

A. selecting:

i) at least one AB monomer having both a carboxylic group (A) and an amine group (B);

ii) at least one compound I, being a carboxylic acid (A_v) having a functionality $v \geq 2$ or an amine (B_w) having a functionality $w \geq 2$;

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iii) at least one compound II, being a carboxylic acid (A_v) having a functionality $v \geq 3$ or an amine (B_w) having a functionality $w \geq 3$, compound II being a carboxylic acid if compound I is an amine or compound II being an amine if compound I is a carboxylic acid;

B. determining the ratio of units derived from all carboxylic acids and amines in the polyamide using the following formula

$$P < 1 / [(F_A - 1)\ (F_B - 1)] \qquad (1)$$

where

$$P = [\Sigma\ (n_i\ f_i)]_X / [\Sigma\ (n_i\ f_i)]_Y \qquad (2)$$

where $P \leq 1$ and either X = A and Y = B, or X = B and Y = A, and

$$F_x = \Sigma\ (n_i\ f_i^2) / \Sigma(n_i\ f_i) \qquad (3)$$

for, respectively, all carboxylic acids (X = A) and all amines (X = B), where f_i is the functionality of either the carboxylic acid ($f_i = v_i$) or amine ($f_i = w_i$), n_i being the number of moles of the carboxylic acid or amine and the summation involving all units derived from carboxylic acids and amines in the polyamide; and

AS

C. polymerizing said at least one AB monomer, said at least one compound I and said at least one compound II in the ratio determined by step B to form an intrinsically gel-free polymer. .

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13. (New) The process of claim 12, wherein

a) the ratio of compound II to compound I is less than 1 where compound II is trifunctional and compound I is bifunctional; or

b) the ratio of compound II to compound I is less than 2 when both compound I and compound II are trifunctional

14. (New) The process of claim 12 wherein the process is continuous.

15. (New) The process of claim 13 wherein the process is continuous.

16. (New) A process for preparing intrinsically gel-free, randomly branched polyamides comprising:

A. selecting:

i) at least one AB monomer having both a carboxylic group (A) and an amine group (B);

ii) at least one compound I, being a carboxylic acid (A_v) having a functionality $v \geq 2$

or an amine (B_w) having a functionality $w \geq 2$;

iii) at least one compound II, being a carboxylic acid (A_v) having a functionality $v \geq 3$ or an amine (B_w) having a functionality $w \geq 3$, compound II being a carboxylic acid if compound I is an amine or compound II being an amine if compound I is carboxylic acid; and

iv) optionally, at least one compound III, being a monofunctional carboxylic acid or a monofunctional amine;

B. determining the amounts of units derived from all carboxylic acids and amines in the polyamide according to any one of the compositions defined by the non-shaded regions depicted in figures 1 through 8; and

AS

C. polymerizing said monomers in the amounts determined in step B, compound I and compound II and optional compound III to form an intrinsically gel-free randomly branched polyamide.

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17. (New) The process of claim 16, wherein

a) the ratio of compound II to compound I is less than 1 where compound II is trifunctional and compound I is bifunctional;

b) the ratio of compound II to compound I is less than 2 when both compound I and compound II are trifunctional

18. (New) The process of claim 16 wherein the process is continuous.

19. (New) The process of claim 17 wherein the process is continuous.

20. (New) The process of claim 16 wherein the ratio of units derived from all carboxylic acids and amines in the polyamide satisfy the following formula

$$P < 1 / [(F_A - 1)\ (F_B - 1)] \qquad (1)$$

where

$$P = [\Sigma\ (n_i\ f_i)]_X / [\Sigma\ (n_i\ f_i)]_Y \qquad (2)$$

where $P \leq 1$ and either X = A and Y = B, or X = B and Y = A, and

$$F_x = \Sigma (n_i f_i^2) / \Sigma(n_i f_i)] \quad (3)$$

for, respectively, all carboxylic acids (X = A) and all amines (X = B), where f_i is the functionality of either the carboxylic acid ($f_i = v_i$) or amine ($f_i = w_i$), n_i being the number of moles of the carboxylic acid or amine and the summation involving all units derived from carboxylic acids and amines in the polyamide.

21. (New) An intrinsically gel-free, randomly branched polyamide comprising units derived from:

AB monomers, which monomers have both a carboxylic group (A) and an amine group (B),

at least one compound I, being a carboxylic acid (A_v) or an amine (B_w) , either compound having a functionality w or v equal to 2 or 3,

at least one compound II, being a carboxylic acid (A_v) or an amine (B_w) having a functionality w or v equal to 3, compound II being a carboxylic acid if compound I is an amine or compound II being an amine if compound I is carboxylic acid wherein:

a) the molar ratio of compound II to compound I is less than 1 when compound I is bifunctional; or

b) the molar ratio of compound II to compound I is less than 2 when compound I is trifunctional

c) the amounts of units derived from all carboxylic acids and amines satisfy the compositions described in one of the non-shaded regions of figures 1 or 2.

22. (New) The process of claim 16 wherein said compound I is difunctional, compound II is trifunctional and the ratio of all carboxylic acids and amines in the polyamide are determined by the non-shaded regions of figure 1.

23. (New) Intrinsically gel-free, randomly branched polyamide comprising at least units derived from:

AB monomers, which monomers have both a carboxylic group (A) and an amine

group (B);

at least one compound I, being a carboxylic acid (A_v) having a functionality $v \geq 2$ or an amine (B_w) having a functionality $w \geq 2$;

at least one compound II, being a carboxylic acid (A_v) having a functionality $v \geq 3$ or an amine (B_w) having a functionality $w \geq 3$, compound II being a carboxylic acid if compound I is an amine or compound II being an amine if compound I is a carboxylic acid,

wherein at least one of compounds I and II comprises a carboxylic acid (A_v) or an amine (B_w) having a functionality v or w chosen from 4, 5, or 6 and the amounts of units derived from all carboxylic acids and amines in the polyamide satisfy the following formula:

$$P < 1 / [(F_A - 1).(F_B - 1)] \qquad (1)$$

where:

$$P = [\Sigma (n_i.f_i)]_X / [\Sigma (n_i.f_i)]_Y \qquad (2)$$

where $P \leq 1$ and either $X = A$ and $Y = B$, or $X = B$ and $Y = A$, and

$$F_x = \Sigma (n_i.f_i^2) / \Sigma(n_i.f_i) \qquad (3)$$

for, respectively, all carboxylic acids ($X = A$) and all amines ($X = B$), where f_i is the functionality of either the carboxylic acid ($f_i = v_i$) or amine ($f_i = w_i$), n_i being the number of moles of the carboxylic acid or amine and the summation involving all units derived from carboxylic acids and amines in the polyamide.

24. (New) Intrinsically gel-free, randomly branched polyamide comprising at least units derived from:

AB monomers, which monomers have both a carboxylic group (A) and an amine group (B);

at least one compound I, being a carboxylic acid (A_v) having a functionality $v \geq 2$ or an amine (B_w) having a functionality $w \geq 2$;

at least one compound II, being a carboxylic acid (A_v) having a functionality $v \geq 3$ or an amine (B_w) having a functionality $w \geq 3$, compound II being a carboxylic acid if compound I is an amine or compound II being an amine if compound I is a carboxylic acid;

optionally, at least one compound III, being a monofunctional carboxylic acid or a monofunctional amine;

wherein at least one of compounds I and II comprises a carboxylic acid (A_v) or an amine (B_w) having a functionality v or w chosen from 4, 5, or 6.

25. (New) The polyamide of claim 24, wherein said compound I is difunctional, compound II is tetrafunctional and the ratio of all carboxylic acids and amines in the polyamide are determined by the non-shaded regions of figure 3.

26. (New) The polyamide of claim 24, wherein said compound I is trifunctional, compound II is tetrafunctional and the ratio of all carboxylic acids and amines in the polyamide are determined by the non-shaded regions of figure 4.

27. (New) The polyamide of claim 24, wherein said compound I is difunctional, compound II is pentafunctional and the ratio of all carboxylic acids and amines in the polyamide are determined by the non-shaded regions of figure 5.

28. (New) The polyamide of claim 24, wherein said compound I is trifunctional,

compound II is pentafunctional and the ratio of all carboxylic acids and amines in the polyamide are determined by the non-shaded regions of figure 6.

29. (New) The polyamide of claim 24, wherein said compound I is difunctional, compound II is hexafunctional and the ratio of all carboxylic acids and amines in the polyamide are determined by the non-shaded regions of figure 7.

30. (New) The polyamide of claim 24, wherein said compound I is trifunctional, compound II is hexafunctional and the ratio of all carboxylic acids and amines in the polyamide are determined by the non-shaded regions of figure 8.